TECHNICAL REVIEW DOCUMENT
For
RENEWAL / MODIFICATION TO OPERATING PERMIT 03OPAD257

Tri-State Generation and Transmission Association, Inc.
Frank Knutson Station
Adams County
Source ID 0011349

Prepared by Blue Parish
June & December 2009
Updated February 2, 2010 based on comments received during public comment
Revised May 2009 to address Excess Emission Reporting Frequency

I. Purpose:

This document establishes the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewal and modification of the Operating Permit for the Tri-State Generation and Transmission Association, Inc. (Tri-State) Frank Knutson Station. The current Operating Permit for this facility was issued on November 1, 2004, was last revised on November 26, 2006 and expired on November 1, 2009. However, since a timely and complete renewal application was submitted, under Colorado Regulation No. 3, Part C, Section IV.C all of the terms and conditions of the existing permit shall not expire until the renewal operating permit is issued and any previously extended permit shield continues in full force and operation.

Prior to submittal of the renewal application, the source had submitted an application on March 3, 2008 to revise their Title V permit to:

- Change the frequency of monthly sampling of fuel oil for gross heating value from monthly to annually and as required in 40 CFR Part 75, Appendix D (which requires sampling for each delivery of fuel oil),
- Clarify the frequency of sampling of fuel oil for sulfur content,
- Change the frequency of opacity readings during fuel oil startup from semiannually to annually, and
- Add a diluent cap for carbon monoxide continuous emission monitoring system (CEMs) data conversions.

The modification to reduce the frequency of existing monitoring conditions represents a significant change in existing monitoring permit terms; therefore the modification must be processed as a significant modification as required by Colorado Regulation No. 3, Part C, Section I.A.7.f. A significant modification is processed under the same procedures as a renewal, i.e. it must go through a 30-day public comment period and EPA 45-day review period. Therefore, since the renewal application has been submitted the Division is incorporating the modification with the renewal.

This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the source's request for a modification submitted on March 3, 2008, the renewal application submitted on October 30, 2008, comments on the draft permit submitted on July 16, 2009, October 19, 2009, December 4, 2009 and December 16 & 18, 2009, the Acid Rain Permit Renewal Application received on July 22, 2009, comments received from the source during the public comment period on January 20, 2010, previous inspection reports and various e-mail correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at http://www.cdphe.state.co.us/ap/Titlev.html. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Source

This facility consists of two combustion turbines. The facility provides peak electrical generation capacity, and is defined under Standard Industrial Classification 4911. The combustion turbines are configured to operate in a simple-cycle mode (exhaust directly to the atmosphere). Each turbine generates approximately 82 MW of electricity. The turbines are primarily fueled with natural gas and are designed to burn No. 2 fuel oil as a back-up fuel source. The turbines are equipped with water injection to control nitrogen oxide emissions when burning oil, and catalytic oxidation to control carbon monoxide emissions.

Based on the information available to the Division and provided by the applicant, it appears that no modifications to the significant emission units has occurred since the original issuance of the operating permit.

The facility is located at 13501 Powhaton Road, in Commerce City, Adams County. This facility is located in the Denver Metro Area. The Denver Metro Area is classified as attainment/maintenance for particulate matter less than 10 microns in diameter (PM10) and carbon monoxide (CO). Under that classification, all SIP-approved requirements for PM10 and CO will continue to apply in order to prevent backsliding under the

provisions of Section 110(l) of the Federal Clean Air Act. The Denver Metro Area is classified as non-attainment for ozone and is part of the 8-hr Ozone Control Area as defined in Regulation No. 7, Section II.A.1.

There are no affected states within 50 miles of the plant. Rocky Mountain National Park is a Federal Class I designated area within 100 kilometers of the plant. Emissions (in tons/yr) at the facility are as follows:

Pollutant	**Potential to Emit (tpy)**	**Actual Emissions (tpy)**
PM	68.5	3.1
PM10	68.5	3.1
SO_2	61.7	0.4
NO_x	244.1	10.1
VOC	3.1	0.02
CO	134.7	1.0
HAP	4.8	Not reported

Potential emissions are based on permit limits. Actual emissions are based on APENs submitted for data year 2008.

Combustion Turbine MACT (40 CFR Part 63 Subpart YYYY)

Since the original permit issuance, Subpart YYYY was published in the Federal Register (March 2004). Subpart YYYY applies to major sources of Hazardous Air Pollutants (HAPs). The facility is not a major source of HAP emissions, so MACT YYYY does not apply.

Standards of Performance for Stationary Gas Turbines (40 CFR Part 60 Subpart GG)

The turbines are subject to the Standards of Performance for Stationary Gas Turbines of Subpart GG.

Compliance Assurance Monitoring (CAM) Requirements (40 CFR Part 64)

The requirements set forth in 40 CFR Part 64, as adopted by reference into Colorado Regulation No. 3, Part C, Section XIV, require emission points that use a control device to meet an emission limit or standard, and which have pre-controlled emissions equal to or greater than major source thresholds to submit a CAM plan. The turbines at this facility are equipped with water injection to control NOx emissions during fuel oil use and a catalyst to control CO emissions. Controlled emissions of both of these pollutants are greater than 100 tons/year. However, the Title V permit requires continuous monitoring for these pollutants. Therefore, CAM requirements do not apply (40 CFR 64.2(b)(vi).

III. Discussion of Modifications Made

Source Requested Modifications

The source's requested modifications identified in the modification application and the renewal application were addressed as follows:

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- Revised the responsible official and permit contact information in accordance with information submitted in the renewal application

Section I – General Activities and Summary

- Updated Condition 1.1 to reflect the current ozone non-attainment status of the Denver Metro Area and to include the Division's current standard language.

- Upon review of the draft permit, the source requested the changes in the Alternative Operating Scenario (AOS) language with respect to the listing of routine turbine component replacements. The language currently reads:

  "The following physical or operational changes to the turbines in this permit are not considered a modification for purposes of NSPS GG, NSR/PSD, or Regulation No. 3:
  1) Replacement of stator blades, turbine nozzles, turbine bucktes, fuel nozzles, combustion chambers, seals, and shaft packings, provided that they are of the same design as the original."

  Tri-State requested that the listing of routine turbine component replacements be changed to:
  "Replacement of compressor stator and rotating blades, turbine nozzles, turbine buckets, turbine shroud block, fuel nozzles, combustion chamber system, seals, and shaft packings, provided that they are of the same design as the original."

  Tri-State explained in their request that the change in language adds greater detail to the description of the turbine and compressor. Routine maintenance and inspections are completed at scheduled intervals, and these parts are replaced due to wear and/or fatigue or as per manufacturer's recommendations. Tri-State also explained that these parts are replaced with "like kind" parts, do not increase the output of the turbine, and that even the cost of a major overhaul would not constitute a reconstruction under the NSPS definition (greater than 50% of the cost of a new turbine). The Division is including the requested changes in the renewal permit.

Section II – Specific Permit Terms

- Corrected a typographical error in the Title of Condition 1 ("S006" was corrected to read "S003" to match the AIRS stack ID number listed in the previous section, Condition 6).

- The renewal application noted that a typographical error occurred in the Condition 1.11 table entry with respect to insignificant activities tracking for NOx (the table references a monthly frequency which should have been annual to reflect the language in Condition 1.11). This has been corrected in the table.

- Condition 1.2 requires that the heat content from each batch of fuel oil be sampled monthly. The renewal application states that fuel oil deliveries occur only one or two times per year, and that the monthly sampling requirement in the current permit results in the same fuel oil being sampled repeatedly until the next shipment arrives. 40 CFR 75 Appendix D requires sampling each shipment of fuel or each addition to the tank. Tri-State requested language requiring sampling as per the requirements of Appendix D, or at least once per calendar year to ensure that data is obtained even in the event that no new shipment is received in a calendar year. The renewal application also notes that 40 CFR 75 Appendix D requires that the highest heat content of all sampled values in the previous calendar year be used to calculate annual emissions, unless a higher sample value is obtained during that month. Tri-State notes that the permit condition requiring the use of the heat content from the most recent sample is not consistent with the Requirements of Appendix D. The Division concurs and has altered the condition accordingly to reflect the actual requirements of Appendix D, and to require at least one sample annually. Condition 1.1 has also been updated to this sampling schedule for fuel oil.

- The fourth paragraph in the Condition describing monitoring of operations under Subpart GG (Condition 1.5.4 in the previously issued permit0 states that the frequency of fuel oil sampling is as set forth in 60.334(I)(3), which addresses the use of custom schedules for determining fuel sulfur content. The option to use the frequency from 40 CFR Part 75, Appendix D was specifically included in Subpart GG in amendments completed in 2004. Additionally, the Knutson Station turbines had obtained EPA approval to use the Appendix D schedule prior to 2004. The renewal application requests that the condition be updated to specifically reference the Appendix D frequency rather than the custom schedule. The language was modified to specifically reference fuel oil (rather than simply "fuel"), and the condition was reworded to require the same frequency as that described in Condition 1.2 for fuel oil heat content (see above). *Note this condition was removed for streamlining purposes following public notice and fuel sulfur sampling requirements are now included in a new subcondition at the end of Condition 1 (see the discussion on changes made following public notice, below).*

- Condition 1.9.2 requires visible emission observations using EPA Method 9 be taken semi-annually when distillate fuel oil is combusted and one of the activities listed under Colorado Regulation No. 1, Section II.A.4 occurs (the building of a new fire, cleaning of fire boxes, soot blowing, start-up, process modifications, or adjustment or

occasional cleaning of control equipment). The renewal application states that the condition applies during turbine startup, and that opacity observations have never been observed while turbine startup occurs on distillate fuel oil. The application requests that the frequency of the condition be changed from semi-annually to annually. The Division concurs and the language has been updated.

- The permit allows that visible emissions observations are not required for any period where no distillate fuel oil is burned. Tri-state notes in comments received July 16, 2009 that if distillate oil is only burned during non-daylight hours or for periods less than six minutes, this will create a situation where the turbine must be started again on fuel oil for the sole purpose of obtaining an opacity reading. Therefore, the Division has modified the Regulation No. 1 opacity conditions to state that visible emission observations are not required during any annual period where no distillate fuel oil is burned, where distillate fuel is not burned for a period of at least six minutes, or when fuel oil is not burned during daylight hours.

- The last sentence of the Acid Rain Requirements Condition (labeled Condition 1.10 in the previous issuance) was removed as this related to annual Acid Rain compliance certifications that only applied for calendar years 1995 – 2005.

- Condition 2.2.1 includes CEMS equipment and quality assurance/quality control requirements. The condition currently requires that the conversion procedures of 40 CFR 75, Appendix F be used for NOx data. Section 3.3.4.1 of Appendix F allows the use of a maximum oxygen content of 19% in the conversion of CEMS measurements when the measured oxygen concentration is above 19.0%. Although the diluent cap for NOx monitoring is included in both 40 CFR 75 and NSPS Subpart GG, it is not included for CO monitoring as there are no CO emission standards in the Part 75 or Subpart GG regulations. The renewal application requests that the same diluent cap for NOx CEMS data conversions be made available for CO CEMS data conversions. The Division concurs and has included the language in Condition 2.2.1.

- Tri-State submitted comments on July 16, 2009 requesting that the condition relating to the calculation of NO_x emissions from insignificant activities (labeled Condition 1.11 in the previous issuance) be removed since the facility is now located in a nonattainment area for ozone and the Nonattainment New Source Review (NANSR) requirements apply for NO_x rather than PSD requirements, and the source is no longer a minor source for NO_x. The Division does agree that NO_x emissions qualify the source as major with respect to ozone under NANSR. However, the area is still in attainment for NO_x emissions, and therefore the 250 ton per year threshold for NOx is still applicable with respect to PSD requirements. Therefore, the Division has left the condition in place.

- Tri-state requested in a December 18, 2009 email that the definition of “start-up” with respect to opacity requirements be clarified in the permit. The permit includes a 30% opacity limit (Colorado Regulation No. 1, Section II.A.4) during certain activities,

including startup (labeled condition 1.9.2 in the previous issuance). The permit also includes a 20% opacity limit (Colorado Regulation No. 6, Part B, Section II.C.3) that applies at all times except during startup and shutdown (labeled Condition 1.9.3 in the previous issuance). The definitions of startup and shutdown applicable to these limits are found in the Common Provisions Regulation: "Startup" means any setting in operation of an air pollutant source for any purpose, and "shutdown" means the cessation of operation of an air pollutant source for any purpose. These definitions have been added into the permit conditions.

Section III – Acid Rain Requirements

- Revised the information on the designated representative (DR) and alternate designated representative (ADR).

- Removed the requirement to submit the annual compliance certification in Section 4 (Reporting Requirements). As a result of revisions to the Acid Rain Program made with the Clean Air Interstate Rule (final published in the federal register on May 12, 2005), annual compliance certifications are no longer required, beginning in 2006.

Section IV – Permit Shield

- Corrected a typographical error in Section IV.3 Streamlined Conditions Table – the first entry is corrected to reference Colorado Regulation No. 6 instead of No. 65.

Appendices

- Added the Econoline Sandblaster with Dust Collector to the list of Insignificant Activities in Appendix A as specified in the renewal application.

Other Modifications

In addition to the source requested modifications, the Division has included changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments to the Tri-State Frank Knutson Renewal Operating Permit. These changes are as follows:

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- It should be noted that the monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance. The source requested to keep the same monitoring and compliance

periods and report and certification due dates that were provided in the original permit. However, it should be noted that, depending on the permit issuance date, the first monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).

- Modified the language concerning postmarked dates for report submittals to reflect the Division's current standard language.

Section I – General Activities and Summary

- Revised the language in Condition 1.4 include current conditions that are state-only enforceable.

- Alternative Operating Scenarios for Turbines - the facility is located in an area that is currently nonattainment for ozone and attainment/maintenance for PM_{10} and CO. RACT requirements apply for new or modified minor sources in these areas as per Colorado Regulation No. 3, Section III.D.2. Because any new turbines at the facility would be subject to a case-by-case RACT determination, turbines cannot be permanently replaced under an AOS. During the last issuance of the permit, the AOS conditions were revised to the latest version, and the permanent replacement provisions were not removed. These provisions are being removed from the renewal permit. No APENs have been submitted to the Division indicating any permanent replacement of the turbines since the original Operating Permit was issued.

- Since the last issuance of this permit, the Denver Metro area has been reclassified nonattainment for ozone. This means that the major source thresholds for VOC and NOx (as precursors for ozone) have dropped from 250 tons per year to 100 tons per year. The facility is permitted at 244.1 tons per year for NOx and 3.1 tons per year for VOC. Therefore, the facility is now classified as a major stationary source for ozone under Non-Attainment New Source Review (NANSR). Condition 3.1 has been updated to include this information. Note that the area retains an attainment designation for NO_x and the major source threshold for NO_x itself remains at 250 tons per year, even though the threshold for NO_x as a precursor to ozone has dropped to 100 tons per year.

- Updated the CAM language in Condition 5.1 to include the appropriate citations.

Section II – Specific Permit Terms

- Updated the language in the Table in Condition 1 for the SO_2 limits and the opacity limits to clarify the difference between monitoring methods and intervals for natural gas vs. fuel oil, and to include minor language changes based on EPA's response to a petition on another Title V operating permit related to the use of fuel restriction as a compliance demonstration.

- Condition 1.2 requires the heat content of the fuel to be based on the "saturated gross heating value." Neither 40 CFR 75 nor NSPS Subpart GG specify that a saturated basis be used for the heat content. Therefore, the Division has deleted the word "saturated."

- Condition 1.2 references Appendix G, which includes information on how NOx emissions vary as the balance of fuel consumption shifts between natural gas usage and fuel oil usage. The stated purpose is to illustrate certain combinations of fuel use which "maintain the minor source status for the facility." Because the facility is no longer a minor source, the condition has been edited to reference the NOx limit instead.

- Condition 1.5.4 addresses Monitoring of Operations under NSPS GG. The second-to-last paragraph discusses excess emissions and monitor downtime reports. The paragraph was reworded to show that reports under 60.7(c) should include monitor downtime as well as excess emissions. Language was also added to include the requirement to report fuel sulfur content monitoring in the reports required under 60.7(c), as required by 60.334(j)(2). *Note this condition has been deleted following public notice due to a request to streamline conditions. See the discussion below on changes made following public notice.*

- Condition 1.5.4 was also updated to show that excess emissions and monitor downtime reports are required on a semi-annual rather than a quarterly basis. Subpart GG was amended in 2006 to clarify that the quarterly frequency was incorrectly stated in the previous version of the rule, and that the actual requirement is semi-annually, except during ice fog events. Condition 2.5 has also been updated accordingly. *These changes have since been removed. See the discussion below on changes made following public notice.*

<u>Section III – Acid Rain Provisions</u>

- Added a requirement to Section 1 (directly under ADR and DR), specifying that changes to the DR and ADR shall be made according to 40 CFR Part 72 § 72.23.

- Revised the table to include calendar years corresponding to the relevant permit term for the renewal.

- Updated the reference to §72.84(a) in the footnotes to the tables in Section 2 to show the most recent version.

- Minor changes were made to the standard requirements, based on changes made to 40 CFR Part 72 § 72.9.

- Modified the language in Section 4 to specify that the submittal of quarterly reports/certifications is now done electronically.

Section IV – Permit Shield

- Removed language referencing 112(j). Since the EPA has signed off on final rules for all of the source categories which were not promulgated by the deadline, the case-by-case MACT provisions in 112(j) no longer apply.

Section V – General Permit Conditions

- Updated the general permit conditions to the current version (7/21/2009).

Appendices

- Updated Appendices B and C (Monitoring and Permit Deviation Reports and Compliance Certification Reports) to the newest versions (2/20/2007).

- EPA's mailing address was revised (Appendix D). Removed the Acid Rain addresses in Appendix D, since annual certification is no longer required and submittal of quarterly reports/certifications is done electronically.

- Cleared the list of modifications from Appendix F related to the previous issuance.

- Updated the language in Appendix G to clarify that the data provided relates to the NOx limit in Condition 1.1. The language previously stated that the data was related to the major stationary source threshold, but this no longer applies as described above.

Modifications Following the Public Notice Period

The source submitted additional comments during the public notice period, received on January 15, 2010. The Division reviewed the comments determined that the changes were not significant and therefore do not warrant re-noticing the draft permit. The modifications completed are:

- Updated the responsible official title and facility contact person on the page following the cover page.

- The source requested that the existing RACT limits for NO_x emissions and for fuel sulfur content be used to streamline out the NSPS Subpart GG limits. The Subpart GG limits for NO_x are 100 ppmvd (natural gas) and 96 ppmvd (fuel oil) on a 4-hr average, while the RACT limits are 9 ppmvd (natural gas) and 42 ppmvd (fuel oil) on a 1-hr average. The Subpart GG limit for sulfur in fuel oil is 0.8% by weight, and the RACT limit is 0.05%. The Division agrees that the limits may be streamlined out (note this streamlining will also override the exemptions from the NO_x standards in Subpart GG §§60.332(f) & (i) – during ice fog and water restriction periods). However, the request to eliminate all of previous condition 1.5 will result in the elimination of all requirements to monitor sulfur content of the fuel (note that the requirements included in condition 1.5 were

those of Subpart GG). Since the source is subject to the acid rain requirements, it is more appropriate to include the fuel sulfur monitoring requirements of Part 75 and to streamline out the Subpart GG monitoring requirements. Therefore, a new subcondition has been added to the end of Condition 1 with the Part 75 requirements, and the conditions describing SO_2 limits and fuel sulfur limits now refer to this new condition. The new fuel oil sulfur monitoring requirements reference the sampling frequency included for heat value sampling in Condition 1.2 (see additional discussion, above).

The removal of Condition 1.5 also results in the removal of the excess emission reporting requirements under Subpart GG. However, excess emission reporting under the Acid Rain rules with respect to the pipeline quality natural gas requirements may be used to streamline out the NSPS GG SO_2/fuel sulfur requirements. Condition 2 in the permit already includes recordkeeping and reporting related to CEMS operation; therefore, this condition can be used to streamline out the Subpart GG NO_x excess emission reporting.

The streamlined conditions table at the end of Section IV has been updated to reflect the subsumed requirements.

- May 2010 Update: The Division has recently made determinations for other operating permits to require Subpart GG EERs quarterly despite the amendments to the rule. Therefore, the Limon permit will be issued with quarterly EER reporting requirements. Since this change reverts to a more frequent schedule that was already included in the previous operating permit, it is determined to be administrative in nature and will not require additional public notice or EPA review.